

STATUS OF CLAIMS

19. (Currently Amended) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

an electrical conductor;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adapted to be connected to an electrical apparatus, said electrical conductor extending through said metal body, said metal body having an annulus surrounding the said electrical conductor along the entire given length of said metal body; [[and]]

an insulation seal in said annulus, said seal comprising, at least in part, a layer of glass surrounding said electrical conductor, said insulation seal at least partially insulating said metal body, thereby insulating said metal body from said electrical conductor, said glass having a melting point greater than 500°F; and

a thermoplastic jacket applied in an initial position over and touching the electrical conductor and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

20. (Previously Presented) The connector according to Claim 19, wherein the coefficient of thermal expansion of the said metal body substantially matches the coefficient of thermal expansion of the said electrical conductor.

21. (Previously Presented) The connector according to Claim 20, wherein the coefficient of thermal expansion of the glass layer substantially matches the coefficients of thermal expansion of the metal body and of the electrical conductor.

22-24. (Cancelled)

25. (Previously Presented) The connector according to Claim 19, wherein said glass layer continues to insulate the electrical conductor from the metal body even when exposed to earth borehole pressures exceeding 30,000 psig.
26. (Cancelled)
27. (Currently Amended) The connector of Claim ~~[[26]]~~ 19, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.
28. (Currently Amended) The connector of Claim ~~[[26]]~~ 19, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.
29. (Currently Amended) The connector of Claim ~~[[26]]~~ 19, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.
30. (Currently Amended) The connector of Claim ~~[[26]]~~ 19, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.

31. (Currently Amended) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

a plurality of electrical conductors;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adapted to be connected to an electrical apparatus, each of said electrical conductors extending through said metal body, said metal body having a plurality of annulus surrounding said plurality of electrical conductors, respectively, each of said electrical conductors having its own annulus surrounding each of the said electrical conductors, respectively, along the entire given length of said metal body; [[and]]

an insulation seal in each said annulus, said seals each comprising, at least in part, a layer of glass surrounding one of said electrical conductors, respectively, insulating said metal body from said electrical conductors, each of said glass layers having a melting point greater than 500°F; and

a thermoplastic jacket applied in an initial position over and touching the electrical conductors and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

32. (Currently Amended) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

an electrical conductor;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adapted to be connected to an electrical apparatus, said electrical conductor extending through said metal body, said metal body having an annulus surrounding the said electrical conductor along the entire given length of said metal body; and

an insulation seal in said annulus, said seal ~~[[surrounding]] comprising, at least in part, a layer of glass and at least one ceramic insulating layer, separate from said layer of glass, said at least one ceramic layer and said glass layer each being in contact with~~ said electrical conductor, ~~said insulation seal~~ having a combined length greater than said given length of said metal body, thereby insulating said metal body from said electrical conductor.

33-36. (Cancelled)

37. (Currently Amended) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

a plurality of electrical conductors;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adaptor to be connected to an electrical apparatus, each of said electrical conductors extending through said metal body, each of said electrical conductors having an annulus surrounding the said electrical conductors, respectively, along the entire given length of said metal body; and

an insulation seal in each said annulus, said seals [[surrounding said electrical conductors]] each comprising, at least in part, a layer of glass and at least one ceramic insulating layer, wherein the glass layer and the at least one ceramic layer in each of said seals are separate from each other, wherein each of said layers in any given seal are in contact with one of the conductors, respectively, said insulation seals each having a combined length greater than said given length of said metal body, thereby insulating said metal body from said electrical conductors.

38-41. (Cancelled)

42. (New) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

an electrical conductor;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adapted to be connected to an electrical apparatus, said electrical conductor extending through said metal body, said metal body having an annulus surrounding the said electrical conductor along the entire given length of said metal body; and

an insulation seal in said annulus, said seal comprising, at least in part, a layer of glass surrounding said electrical conductor, said insulation seal at least partially insulating said metal body, thereby insulating said metal body from said electrical conductor, said glass having a melting point greater than 500°F, said insulation seal also comprising at least one ceramic insulating layer, separate from said layer of glass, said at least one ceramic layer and said glass layer each being in contact with said electrical conductor.

43. (New) The connector according to Claim 42, comprising in addition thereto, a thermoplastic jacket applied in an initial position over and touching the electrical conductor and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

44. (New) The connector of Claim 43, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.

45. (New) The connector of Claim 43, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.

46. (New) The connector of Claim 43, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.

47. (New) The connector of Claim 43, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.

48. (New) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

a plurality of electrical conductors;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adapted to be connected to an electrical apparatus, each of said electrical conductors extending through said metal body, said metal body having a plurality of annulus surrounding said plurality of electrical conductors, respectively, each of said electrical conductors having its own annulus surrounding each of the said electrical conductors, respectively, along the entire given length of said metal body; and

an insulation seal in each said annulus, said seals each comprising, at least in part, a layer of glass surrounding one of said electrical conductors, respectively, insulating said metal body from said electrical conductors, each of said glass layers having a melting point greater than 500°F, each of said seals also comprising at least one insulating ceramic layer, wherein the glass layer and the at least one ceramic layer in each of said seals are separate from each other, wherein each of said layers in any given seal are in contact with one of the conductors, respectively.

49. (New) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

an electrical conductor;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adapted to be connected to an electrical apparatus, said electrical conductor extending through said metal body, said metal body having an annulus surrounding the said electrical conductor along the entire given length of said metal body;

an insulation seal in said annulus, said seal comprising, at least in part, a layer of glass, said layer of glass being in contact with said electrical conductor, said insulation seal having a combined length greater than said given length of said metal body, thereby insulating said metal body from said electrical conductor; and

a thermoplastic jacket applied in an initial position over and touching the electrical conductor and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

50. (New) A connector adapted for mounting to an electrical apparatus which can be moved through an earth borehole having either high pressure or high temperature, or both high temperature and high pressure, comprising:

a plurality of electrical conductors;

a metal body having first and second ends, and having a given length between said first and second ends, said metal body adaptor to be connected to an electrical apparatus, each of said electrical conductors extending through said metal body, each of said electrical conductors having an annulus surrounding the said electrical conductors, respectively, along the entire given length of said metal body;

an insulation seal in each said annulus, said seals comprising, at least in part, a layer of glass, wherein said layer of glass is in contact with one of the conductors, respectively, said insulation seals each having a combined length greater than said given length of said metal body, thereby insulating said metal body from said electrical conductors; and

a thermoplastic jacket applied in an initial position over and touching the electrical conductors and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

51. (New) The connector of Claim 50, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.

52. (New) The connector of Claim 50, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.

53. (New) The connector of Claim 50, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.
54. (New) The connector of Claim 50, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.
55. (New) The connector of Claim 31, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.
56. (New) The connector of Claim 31, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.
57. (New) The connector of Claim 31, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.
60. (New) The connector of Claim 31, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.

59. (New) The connector according to Claim 32, comprising in addition thereto, a thermoplastic jacket applied in an initial position over and touching the electrical conductors and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

60. (New) The connector of Claim 59, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.

61. (New) The connector of Claim 59, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.

62. (New) The connector of Claim 59, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.

63. (New) The connector of Claim 59, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.

64. (New) The connector according to Claim 37, comprising in addition thereto, a thermoplastic jacket applied in an initial position over and touching the electrical conductors and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.

65. (New) The connector of Claim 64, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.
66. (New) The connector of Claim 64, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.
67. (New) The connector of Claim 64, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.
68. (New) The connector of Claim 64, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.
69. (New) The connector according to Claim 48, comprising in addition thereto, a thermoplastic jacket applied in an initial position over and touching the electrical conductors and touching said metal body, and movable to a second, radially outwards position for sealing against the electrical apparatus when subjected to either high temperature or high pressure, or both high temperature and high pressure.
70. (New) The connector of Claim 69, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.

71. (New) The connector of Claim 69, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.
72. (New) The connector of Claim 69, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.
73. (New) The connector of Claim 69, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.
74. (New) The connector of Claim 49, wherein said thermoplastic jacket is applied by overmolding or press-fitting said jacket over said metal body having the conductor extending therethrough.
75. (New) The connector of Claim 49, wherein said thermoplastic jacket is comprised of an aromatic polyether ketone.
76. (New) The connector of Claim 49, wherein said thermoplastic material is selected from the group consisting of PEK, PEEK, PAEK, and PEKK and blends of PEK, PEEK, PAEK, and PEKK with other plastics, modifiers, extenders, and polymers.
77. (New) The connector of Claim 49, wherein said thermoplastic jacket is comprised of a thermoplastic that is non-hydrolyzable and resistant to high temperature wellbore fluids, acids, and solvents, maintains favorable dielectric properties and volume resistivity at high temperatures, and retains high viscosity at high temperature and pressure.